

**IN THE UNITED STATES PATENT AND TRADE MARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

Appl. No. : 10/708,642 Confirmation No. 2641
Applicant : Chih-Chung Chuang,
Shin-Jien Kuo,
Chao-Yun Cheng,
Shu-Feng Wu
Filed : March 17, 2004
TC/A.U. : 1794
Examiner : GEORGE, PATRICIA ANN
Docket No. : ADTP0066USA
Customer No. : 27765

For: METHOD FOR FABRICATING LIQUID CRYSTAL DISPLAY PANEL
ARRAY

5 **REPLY BRIEF PURSUANT TO 37 C.F.R. § 41.41**

MAIL STOP APPEAL BRIEF - PATENTS

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

10

Sir:

In accordance with the provisions of 37 C.F.R. § 41.41, Appellant respectfully submits this reply brief in response to the Examiner's Answer dated 03/20/2008. Entry of this Reply Brief is respectfully requested.

15

Table of Contents

STATUS OF CLAIMS

5 GROUND OF REJECTION TO BE REVIEWED ON APPEAL
 ARGUMENT
 CONCLUSION

10

STATUS OF CLAIMS

Claims 1-5, and 7-12 are rejected in the Final Office Action dated March 09, 2007. Claim 6 is cancelled in an Amendments to the Claims dated May 28, 2007, Claim 7 is cancelled in an Amendments to the Claims dated Dec 05, 2007 and Claim 16 was cancelled on April 13, 2006. Claim 21 is added in an Amendments to the Claims dated Dec 05, 2007. Furthermore, the claim amendments filed on Dec 05, 2007 have been entered as indicated in the Advisory Action dated Jan 09, 2008. Claims 13-15 and 17-20 are allowed in the aforementioned Final Office Action. Applicants appeal the rejected Claims 1-5, 8-12 and 21 in the appeal brief.

10

15

20

GROUND OF REJECTION TO BE REVIEWED ON APPEAL

Appellant argues, on page 13-14, that the references of Hong et al. (6429057), Rioux (5554488) and Kim et al. (4981816) fail to achieve the claimed limitation of substantially oblique sidewalls is the direct result of the uniformly etching of the molybdenum-containing metal layer, examiner disagrees. The reference of Hong teaches it is preferable to use dry etching to form word lines (a structure with sidewalls) of molybdenum-containing metal (col. 6, lines 14-34 and Background section). Hong may be silent as to the sidewalls being substantially oblique, however one of skill would recognize no perfect process exists and therefore etched sidewalls would be substantially oblique. Because of Hong's silence, the reference of Rioux was used to cure the deficiency of an explicit recitation. Taking the reference of Rioux in the entirety, one of skill would note the background and figures 1 to 2 as a teaching of conventional etching methods which use a controlled etch process, for the purpose of forming substantially oblique sidewalls. The teaching of Rioux also is used to point out that a variety of methods results in substantially oblique sidewalls. See figure 2, discussed in column 1-2, and col. 6 lines 14-34. Appellant continue to argue that the reference of Rioux is not formed by etching. Please see Background sections col. 6, lines 14-34, for evidence that Rioux teaches use of etching to form the tapered (i.e. substantially oblique) sidewalls. Rioux does teach methods that form tapered (i.e. substantially oblique) sidewalls through deposition, as appellant argues, however Rioux also includes similar structure by etching methods.

Appellant argues, on page 13-14, 15 and 19, that the references of Hong et al., Rioux et al., are improper combination because Hong is directed toward a method of dry etching and Rioux is toward a method of deposition, examiner disagree. Although Rioux does teach methods that form tapered (i.e. substantially oblique) sidewalls through deposition, as appellant argues, however Rioux also includes teaching of etching methods for forming tapered (i.e. substantially oblique) sidewalls.

ARGUMENT

The Appellant submits that the teaching of Rioux in the Background section actually discusses the drawbacks of etching for forming tapered sidewalls. It mentions 1) the tungsten silicide layer 14 tends to be **undercut at region 15** under the edges of the tungsten layer 16 after etching, 2) the substrate **surface 20** surrounding the gate structure is exposed to the metal etch and may **sustain ion damage**, 3) **tungsten and tungsten silicide residues 22 may be left on the substrate surface 20**. (See the drawing and the corresponding description below)

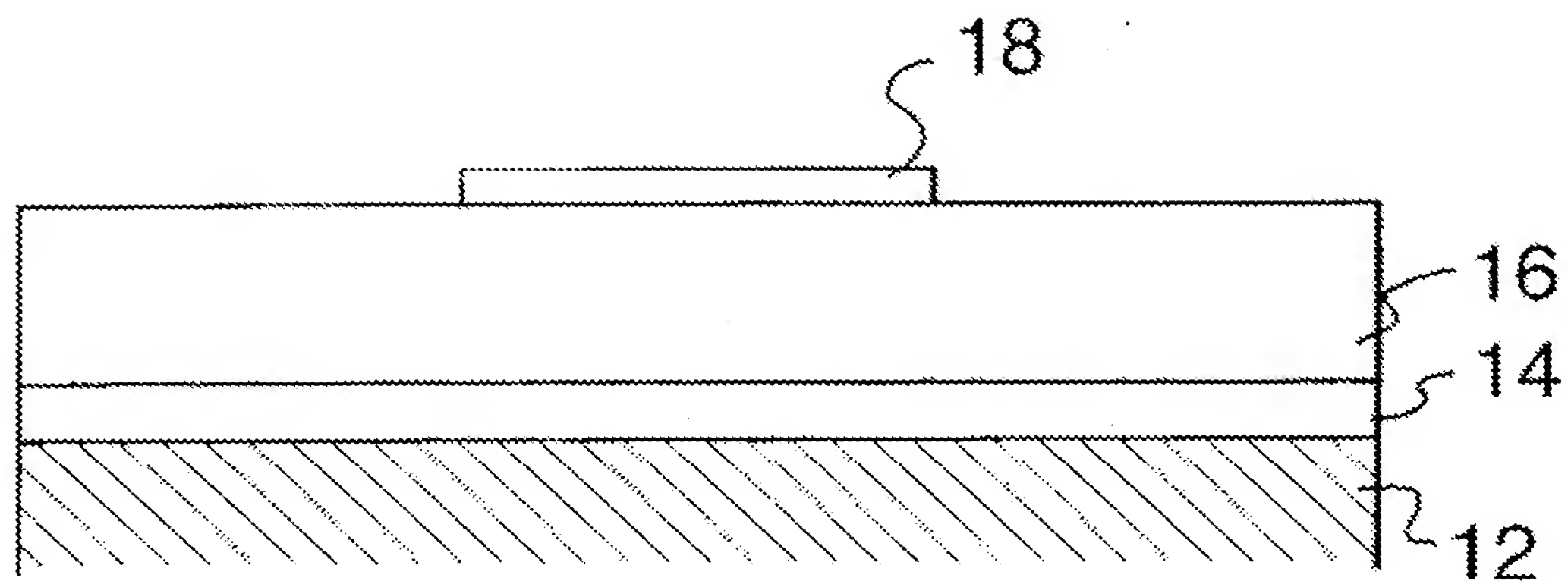


FIG. 1
(PRIOR ART)

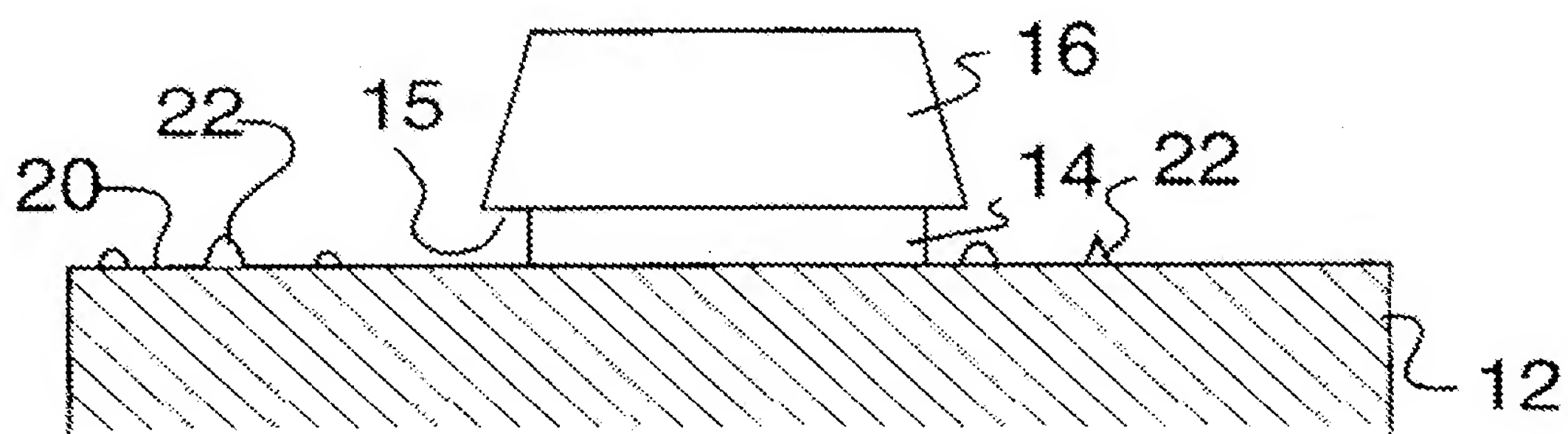


FIG. 2
(PRIOR ART)

In FIG. 1, the structure is then subjected to a high energy plasma etch to remove the gate metal stack comprising layers 14 and 16, from the substrate surface 20 leaving the gate structure under the gate etch mask 18. The gate etch mask 18 is then removed. After etching, the resulting gate structure is as shown schematically in FIG. 2. The

*sidewalls of the tungsten layer 16 may be tapered slightly, but the tungsten silicide layer 14 tends to be undercut at region 15 under the edges of the tungsten layer 16. The substrate **surface 20** surrounding the gate structure is exposed to the metal etch and may **sustain ion***
5 ***damage. Also, tungsten and tungsten silicide residues 22 may be left on the substrate surface 20.***

Therefore, after reading the above information disclosed in Rioux, persons of ordinary skills in the art would clearly understand that the etching method is *innately* flawed and not preferred. Since Rioux proposes an alternative method (i.e. the
10 deposition method) to replace the *innately* flawed etching method, the Appellant firmly believes that the etching method disclosed in Rioux is in fact a demonstration of “teaching away” in order for the introduction of the inventive deposition method.

Examiner answers that “because of Hong’s silence, the reference of Rioux was used to cure the deficiency of an explicit recitation,” Appellant therefore considers
15 this reason as “a reference X must provide enough information to motivate a person of ordinary skills in the art to combination itself with Hong to accomplish the efficacy of the present application.” However, since Rioux has discussed the drawbacks of forming tapered (i.e. substantially oblique) sidewalls by means of etching, in the absence of a further guidance of another better solution, persons of ordinary skills in
20 the art will be surely considering the etching method for forming tapered (i.e. substantially oblique) sidewalls **unqualified** and choose the method of deposition **instead** to avoid the obvious and apparent problems.

Given the above, Appellant accordingly reckons that a piece of flawed information (Rioux) is NOT qualified to be the reference to combine with Hong et al. (6429057)
25 because the disclosure of Rioux innately bars itself from combining with other etching-related references. In other words, the gist of the present application CANNOT be deduced by referring to Hong in the light of Rioux.

Appellant wishes to stress again that the references of Hong et al. (6429057) and Rioux et al. (5554488) together still fail to achieve the claimed limitation of
30 substantially oblique sidewalls is the direct result of the uniformly etching of the molybdenum-containing metal layer. Further, Hong and Rioux are an improper

combination because Hong is directed toward a method of dry etching and Rioux is a demonstration of “teaching away” of an etching method.

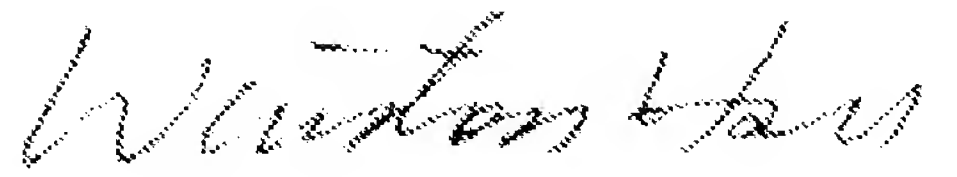
To sum up, it is concluded that the Examiner is attempting to use non-analogous art and incorrect combination reasoning in attempting to achieve the claimed invention.

In the light of the above reasons and lack of disclosure of every feature, the applicants firmly believe that these distinct features distinguish the present invention from the combination of cited prior art references. To summarize, Claims 1 and 21 are patentable over Hong et al. (US 6,429,057) in view of Rioux (US 5,554,488) and Kim et al.

CONCLUSION

For at least the reasons set forth above, it is respectfully submitted that the rejection of claims 1-5 and 8-12 and 21 are improper and should be reversed.

Sincerely yours,



Date: 04/22/2008

Winston Hsu, Patent Agent No. 41,526

P.O. BOX 506, Merrifield, VA 22116, U.S.A.

Voice Mail: 302-729-1562

Facsimile: 806-498-6673

e-mail : winstonhsu@naipo.com

Note: Please leave a message in my voice mail if you need to talk to me. (The time in D.C. is 12 hours behind the Taiwan time, i.e. 9 AM in D.C. = 9 PM in Taiwan.)